

FIG 1

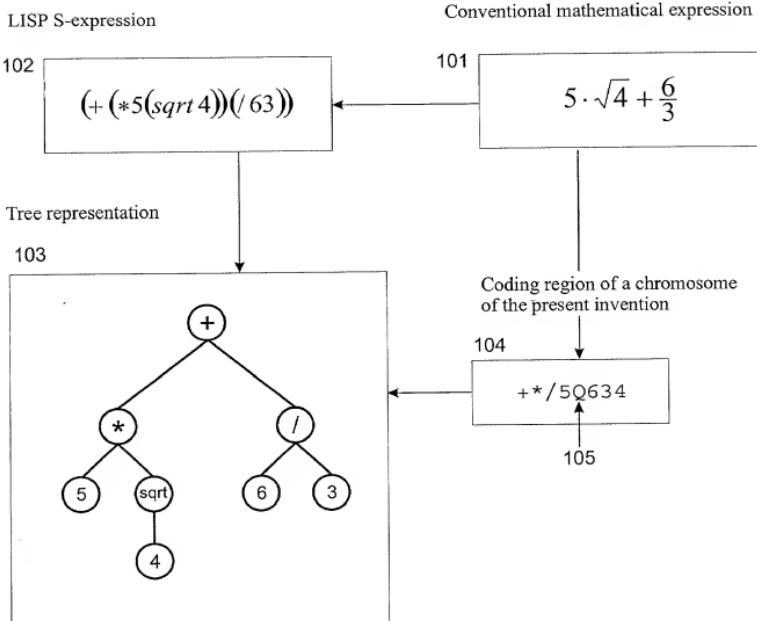


FIG 2

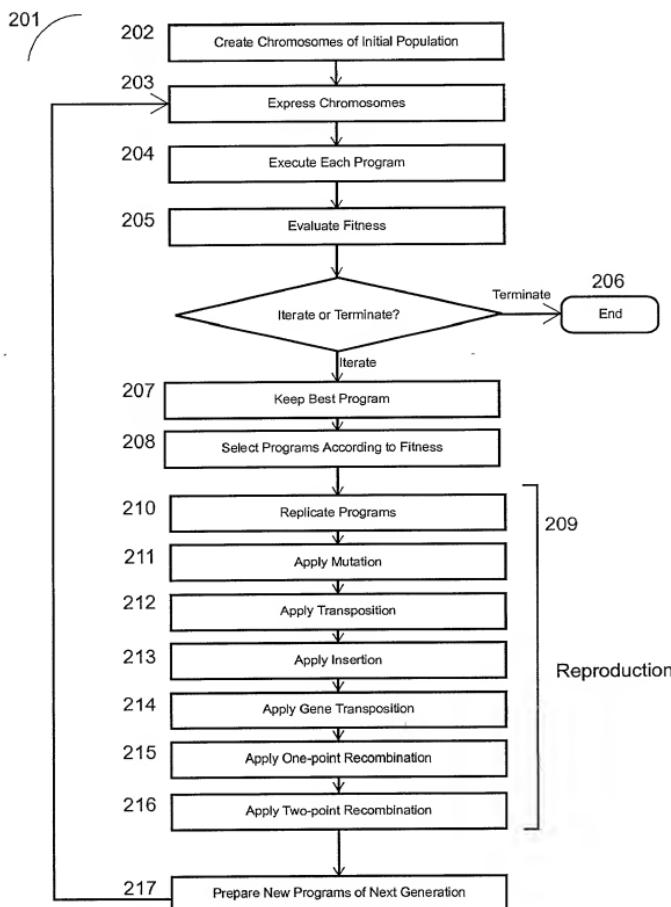


FIG 3

305 306 307 308 309 310
h1 t1 h2 t2 h3 t3
301 Q+aabbaab* --- babba* / b - bbaaa
 gene 1 gene 2 gene 3
 302 303 304

709070 * 28266260

FIG 4

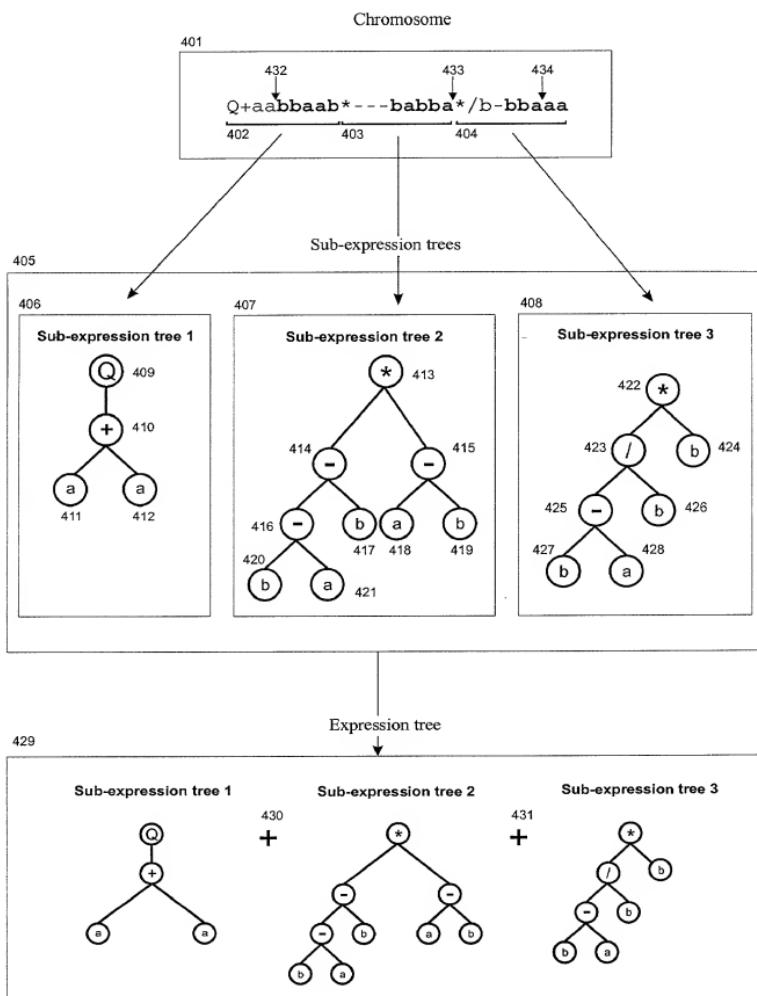


FIG 5

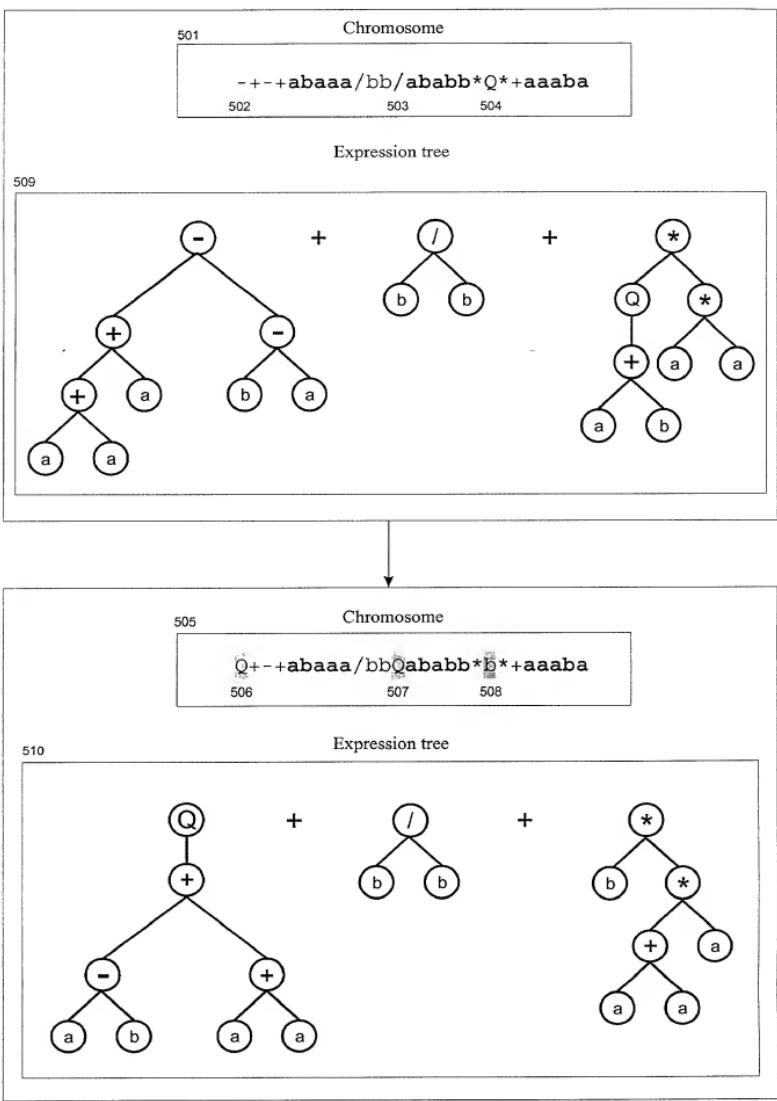
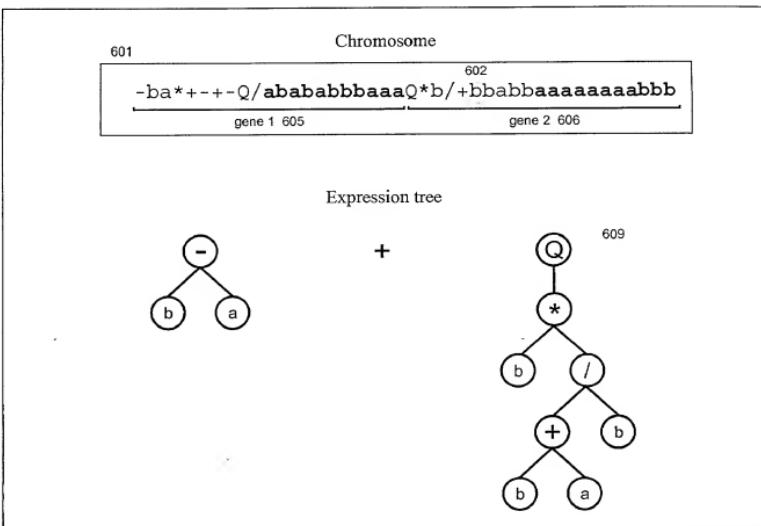


FIG 6



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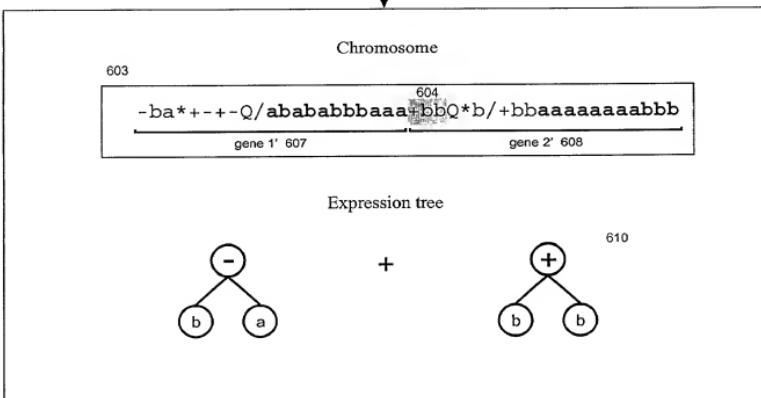


FIG 7

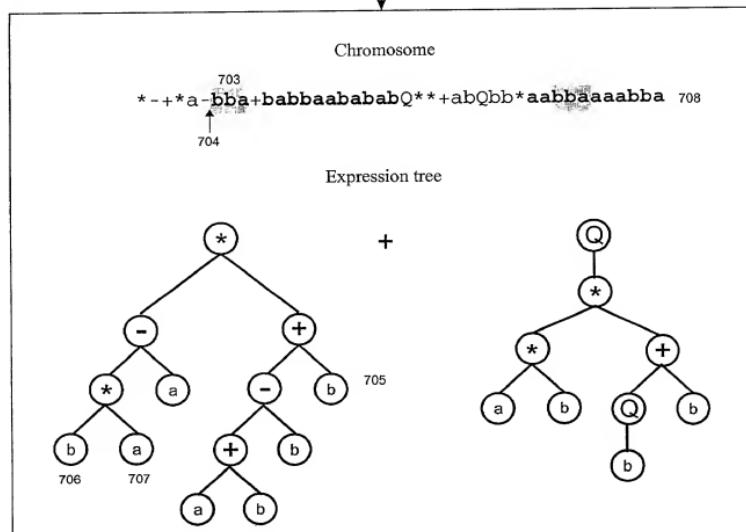
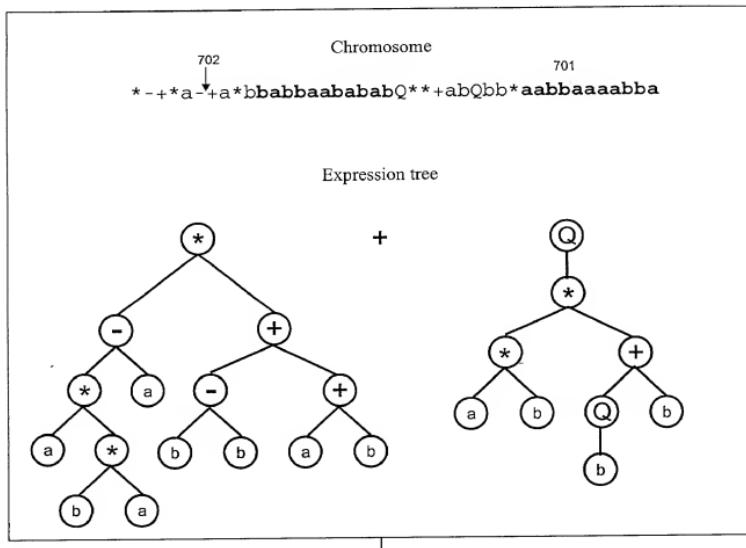
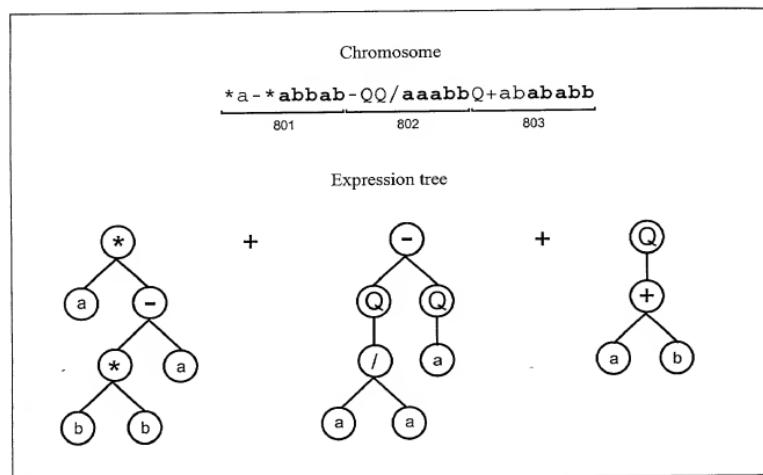


FIG 8



Chromosome

-QQ/aaabb*a-*abbabQ+abababb
804 805 806

Expression tree

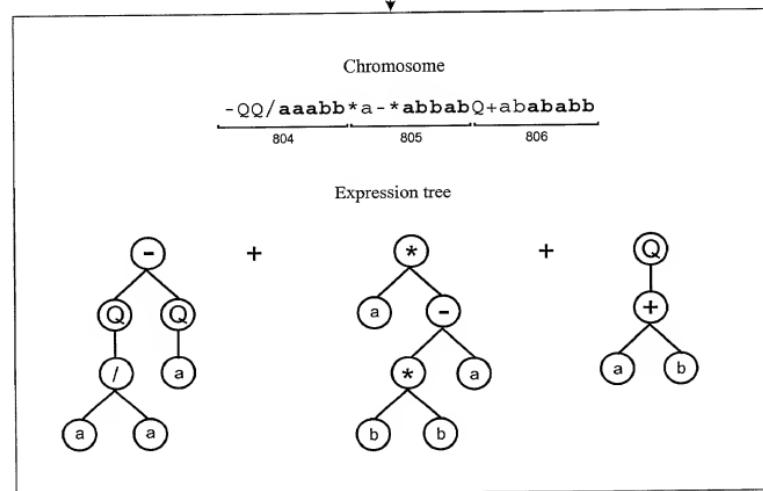


FIG 9

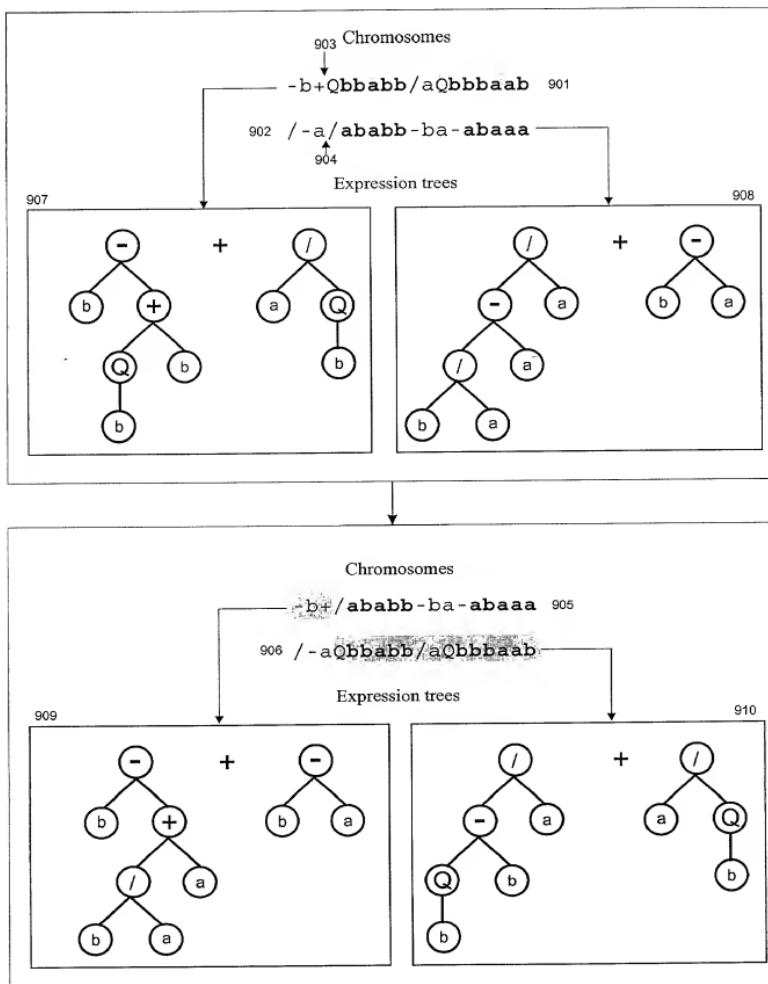


FIG 10A

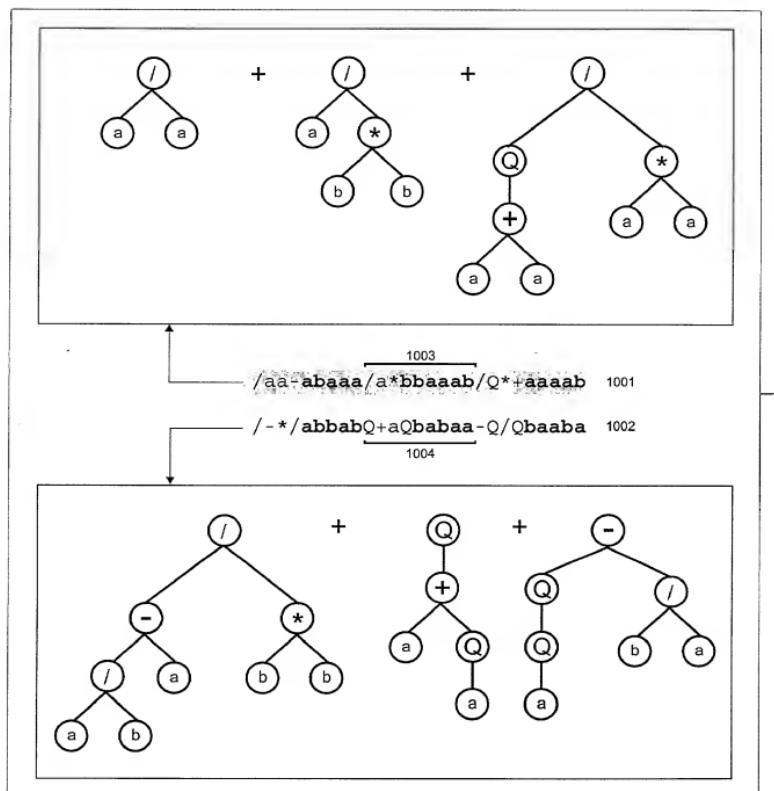


FIG 10B

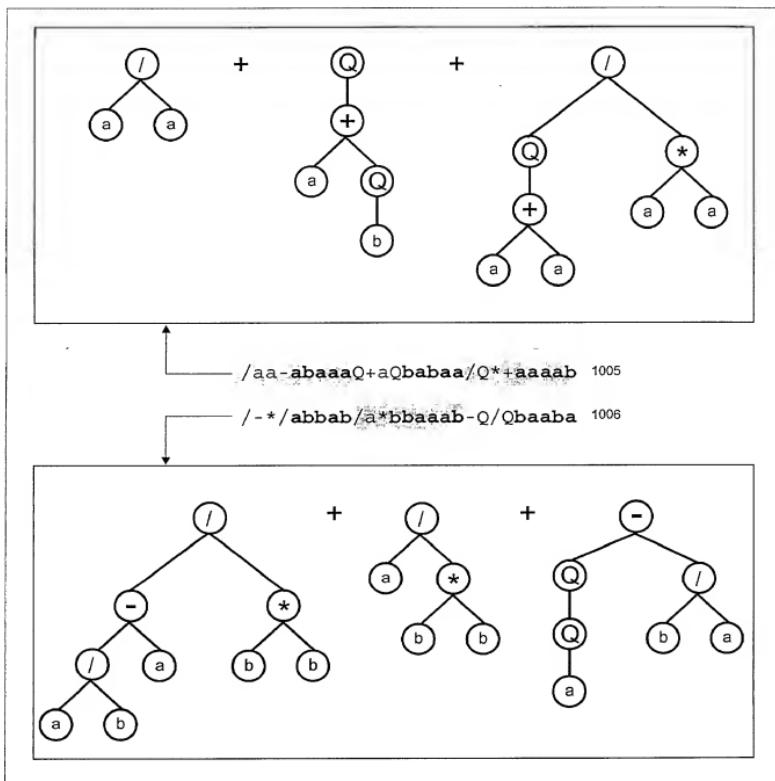


FIG 11

1101	Chromosomes	Fitness
//**-aaaaaa--+aaaaaa+**+aaaaaa*+++aaaaaaaa-[0] = 0		
//+/aaaaaa+/*+/aaaaaa*-a-*aaaaaa-a**+aaaaaa-[1] = 0		
+a**+aaaaaaa+-+**aaaaaa*---aaaaaa*++*-aaaaaa-[2] = 73.35578		
+*a*-aaaaaa/-+a/aaaaaa-/+**aaaaaa**/-aaaaaa-[3] = 0		
/+**aaaaaa/a/+aaaaaa/aa+aaaaaa/-/+aaaaaa-[4] = 26.6697		
++/-aaaaaa/-*/aaaaaa+**aaaaaa/a*a-aaaaaa-[5] = 0		
+**//aaaaaa-*a*aaaaaa/-//aaaaaa/+/*aaaaaa-[6] = 25.44238		
---aaaaaa+a*aaaaaa-a**aaaaaa/-*-aaaaaa-[7] = 0		
*a+-aaaaaa**a*aaaaaa*-a-aaaaaa//++aaaaaa-[8] = 22.67557		
/+--+aaaaaa*/+/*aaaaaa/aa**aaaaaa*/a-aaaaaa-[9] = 0		
*+a/+aaaaaa+**/-aaaaaa+/*/aaaaaa*a-aaaaaa-[10] = 35.0658		
-a-*aaaaaa+**/aaaaaa+-+aaaaaa*a/+aaaaaa-[11] = 97.6903		
/aaaaaa**//aaaaaa/aa**aaaaaa+**/aaaaaa-[12] = 45.73774		
*-a-aaaaaa+**/aaaaaa+**aaaaaa--a-aaaaaa-[13] = 0		
+**/-aaaaaa-*a/aaaaaa/-/aaaaaa/+---+aaaaaa-[14] = 0		
+**//aaaaaa*///aaaaaa/a-aaaaaa---+*aaaaaa-[15] = 0		
/aa--aaaaaa+**-/aaaaaa+**/aaaaaa/-a+aaaaaa-[16] = 7.7575		
++*-aaaaaa+**-aaaaaa+*a-+aaaaaa/a/*-aaaaaa-[17] = 0		
+++aaaaaa-/-*-aaaaaa*a/+aaaaaa+**-aaaaaa-[18] = 0		
+a-+*aaaaaa/a+/aaaaaa//**-aaaaaa*/a'/aaaaaa-[19] = 0		
--a+-aaaaaa*aaa/aaaaaa+*+/aaaaaa*a/-aaaaaa-[20] = 21.5497		
/+***aaaaaa+a+/aaaaaa+**-aaaaaa/+*a/aaaaaa-[21] = 18.06512		
/+aa-aaaaaa+//aaaaaa+a+-/aaaaaa-*/*-aaaaaa-[22] = 17.4636		
/-+/-aaaaaa/-+*+aaaaaa/a/-*aaaaaa+**-aaaaaa-[23] = 0		
++*-aaaaaa*a-aaaaaa/-+aaaaaa/-/*/aaaaaa-[24] = 27.9458		
-/-aaaaaa-+a*aaaaaa+**-aaaaaa+/-aaaaaa-[25] = 0		
+--aaaaaa+/+aaaaaa-*a/*aaaaaa+*-a/aaaaaa-[26] = 18.2736		
-*+a+aaaaaa/-+/*+aaaaaa+**aa*aaaaaa/-/a-aaaaaa-[27] = 80.0881		
/-++-aaaaaa+**/-/aaaaaa/-+*aaaaaa/-**+aaaaaa-[28] = 0		
+--*/aaaaaa-*--+aaaaaa/a/+aaaaaa*a/+aaaaaa-[29] = 31.31912		

Chromosome number

FIG 12

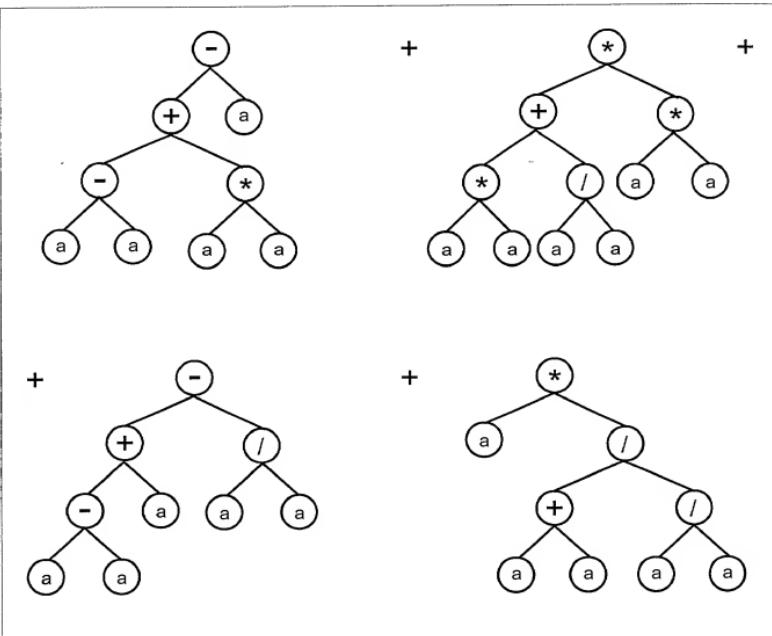
Chromosome

1201

- + a - * aaaaaaa * + ** / aaaaaaa - + - aaaaaaaaaa * a / + / aaaaaaa

Expression tree

1202



Mathematical expression

1203

$$y = (a^2 - a) + (a^4 + a^2) + (a - 1) + (2a^2) = a^4 + 4a^2 - 1$$

FIG 13

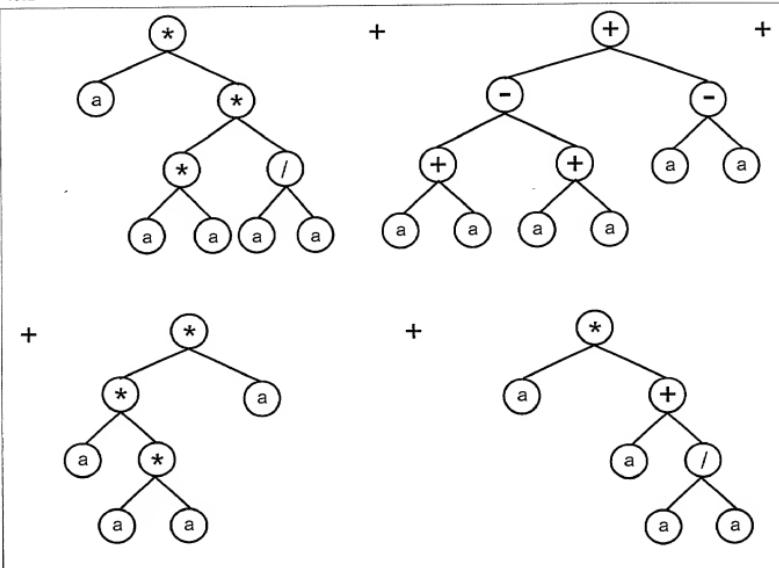
Chromosome

1301

*a**/aaaaaa+--++aaaaaa**aa*aaaaaa*a+a/aaaaaaaa

Expression tree

1302



Mathematical expression

1303

$$y = (a^3) + (0) + (a^4) + (a^2 + a) = a^4 + a^3 + a^2 + a$$

FIG 14

	Present Invention	Genetic Programming
G	50	51
P	30	500
C	10	20
P_s	1	0.35
R_z	1	11
F_z	15,000	5,610,000

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FIG 15

Fitness cases' stacks

```
luaine####-0
unervsi##-1
auvse## #-2
nalvuesri-3
s##### -4 1501
sluavn## -5
esiv### #-6
narsv### #-7
vlera### #-8
##### -9 1502
```

1503	Chromosomes	Fitness
ApAAputpCuRputpAttCptuu-[0]	= 1	
ARRputtpAAupupupNCRNuttu-[1]	= 0	
CCRAppttCApNuptppRNAAttpp-[2]	= 1	
ANpNtutpCARputuuuNRPAttut-[3]	= 1	
ARC RtpfRuuaAppptpAtpputp-[4]	= 1	
ApuApuuutAACutupuACNptpppu-[5]	= 0	
RARuputppCACApptupRCRNtttu-[6]	= 0	
AtAuppppuCuAtppptuNACAttpp-[7]	= 1	
NtNAuputpACutppptuCuCRRptppu-[8]	= 0	
NtANpptutAuRptpppuRpNAutput-[9]	= 1	
AuuttttuRptRpttuRARutput-[10]	= 0	
CpNRtuuupCCCNputpRptCuptuu-[11]	= 2	
RACApptutCACTutuupNRTNptput-[12]	= 1	
AApNuuttpANCututuRCAutputp-[13]	= 0	
CtCututtuCAAAutputuANRNuttp-[14]	= 0	
CAAptputCATNuptpuAtpAtutut-[15]	= 1	
NpAAupppuAAAutputuAttRtput-[16]	= 1	
AARtttuuNaARTppuAAutututp-[17]	= 1	
ApRAtutptNNAApffffuActRtpuup-[18]	= 0	
AAAffffputRNAcupptpACNtutpu-[19]	= 0	
CpRNpppuACANttttNAAAutput-[20]	= 2	
AtNAututtAupttuupARRCtuppp-[21]	= 0	
CAAAtputuAtANptputuAApptpuut-[22]	= 1	
ARNRtuuupApAttpuApRNpuut-[23]	= 0	
RtNNtupppCtAuuuppuCAAmputu-[24]	= 0	
RCAtuupttAutApptuApAtAttuu-[25]	= 0	
RtuAuputtAAApptutuRpRpptpuu-[26]	= 1	
CpAAputuCCpNptttaAuuRppupt-[27]	= 2	
AACRtpupuRuAAttputCAuuppuuu-[28]	= 2	
RuAAputtuRACNuupptAuRppuupp-[29]	= 2	

Chromosome number

FIG 16

Fitness cases' stacks

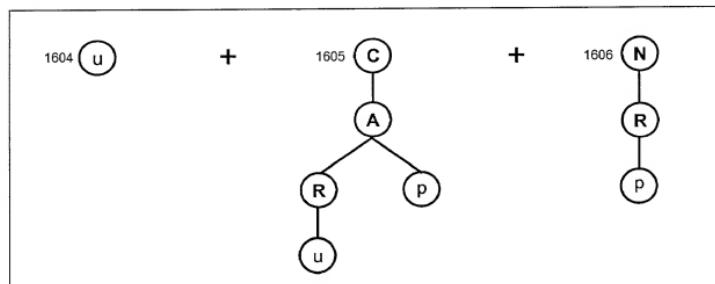
1601
rilasnmvu#-0
rls####-1
anruievels-2
nr#####-3
viaslze##-4
ievlancru#-5
uenari###-6
neai#####-7
li#####-8
#####-9

1602

1603 Chromosome

uNpNttupCARpuutupNRpCtutut

Expression tree

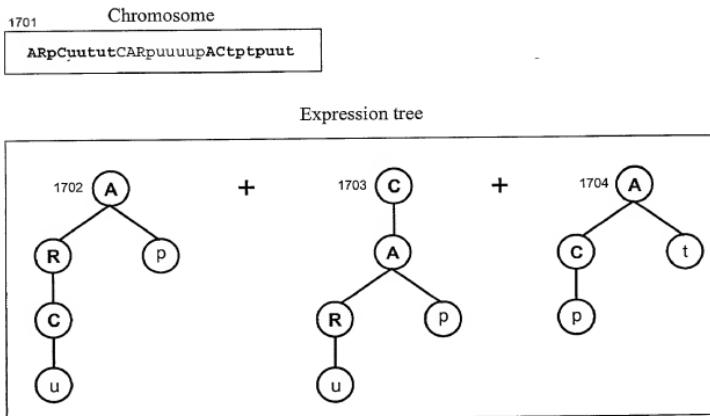


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FIG 17

Fitness cases' stacks

```
s#####-0
vulnsiier-1
iuvr#####-2
riev#####-3
ui#####-4
isunrl#####-5
unilav#####-6
lireav#####-7
ni#####-8
#####-9
```



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FIG 18

Fitness cases' stacks

```
avnurle##-0
vsrui#####-1
uerlvsnai-2
saelnu##-3
linv#####-4
sivnrlaeu-5
vulrsaine-6
esla#####-7
vnarlseii-8
#####-9
```

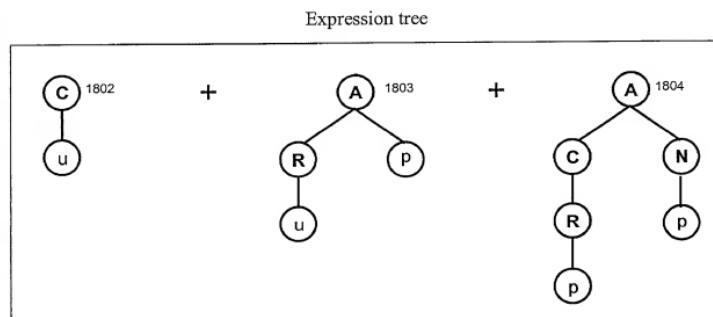
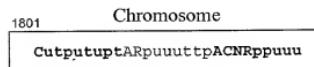


FIG 19

	Present Invention	Genetic Programming
G	100	51
P	30	500
C	10	167
P _S	0.70	0.767
R _Z	4	4
F _Z	120,000	17,034,000

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FIG 20

2001	Chromosome	Fitness
A031N4322a4	AAAAbb342444AAAaN244bb3AAA2Nb3a1b	= 44

2003 Expression tree

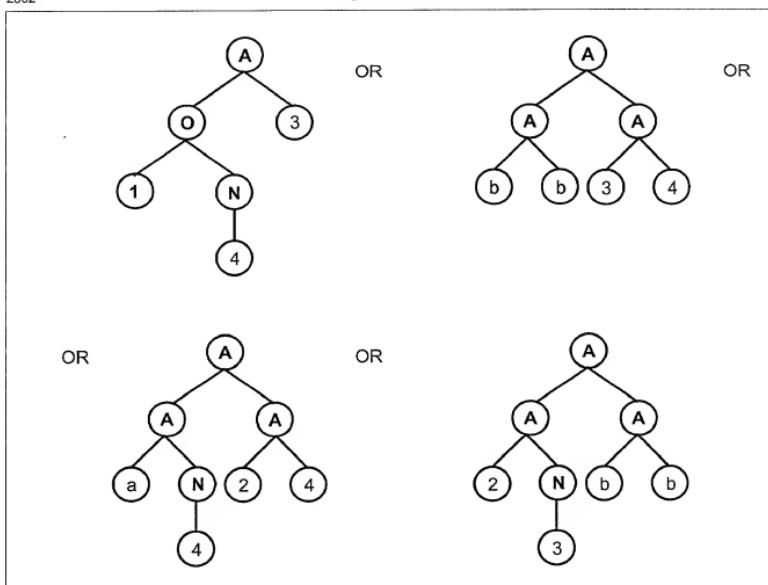


FIG 21

2101	Chromosome	Fitness
A1A2Bb4443aAaO3O133311AaO3bbbbb322AO21Abb4a33	= 132	

2102 Expression tree

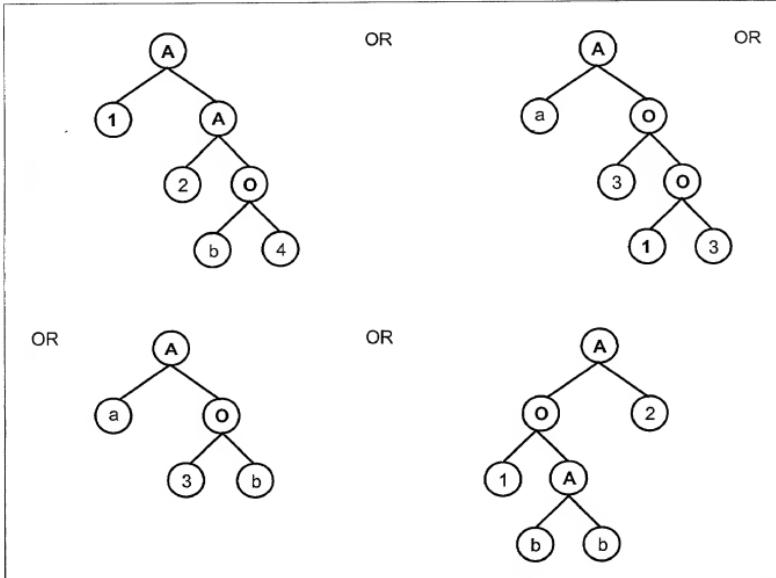


FIG 22

2201	Chromosome	Fitness
AOOOAAa21b3aAaO33133311AaN31bb4321AON1Abb4a3b	= 216	

2202 Expression tree

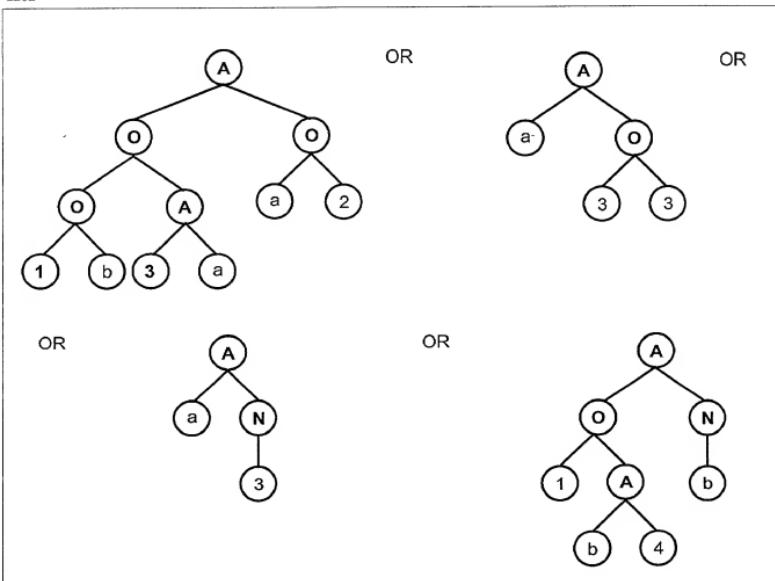


FIG 23

2301	Chromosome	Fitness
AAN2baa4b2bAAO4Ab33a31AaANA3b4312AON1bb1b233	= 310	

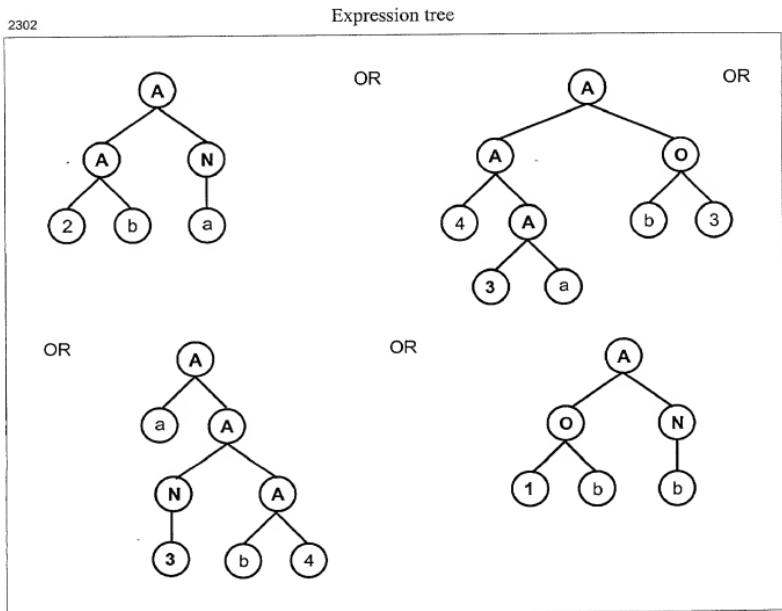


FIG 24

2401	Chromosome	Fitness
AANAb _a 22a41AAOb _b Ab14a2bAaA3Nb _a 1111AAN1Nb _a 2a2b	= 400	

